4.6.2.5 Subalternative Not Including Strategic Reserve and Weapons Research and Development Materials

If the strategic reserve and weapons R&D materials are not included, the incremental impacts would remain the same for some resources because the building would be approximately the same (for example, land, geology, cultural). For other resources the change would be minimal because there would be a slight decrease if the strategic reserve is not included (for example, radiological releases to the public). Other impacts are proportional to the amount of material being stored.

4.6.2.6 Phaseout

For both the Consolidation and Collocation Alternatives, storage of existing Pu and HEU materials at various sites would be phased out. In addition, storage of existing Pu and HEU materials would be phased out at LANL and RFETS as a result of some of the Upgrade Alternatives. Phaseout would have no or negligible impacts for all environmental resource and issue areas except cultural resources at all DOE sites other than Pantex, and public and occupational health and safety at all DOE sites. The impacts of intersite transportation are addressed under the Consolidation and Collocation Alternatives. For all DOE sites, with the exception of Pantex, phaseout could potentially affect cultural resources if any of the structures eligible for NRHP listing are modified or are not maintained. Currently, none of the affected structures in Zone 4 at Pantex are considered eligible for NRHP listing. All of the regional economic areas surrounding the affected DOE sites would experience a loss in employment with phaseout. However, compared to the total employment in these areas, the loss of jobs would be small and would have no or negligible impacts.

[Text deleted.] Phaseout of existing Pu storage facilities would reduce the impacts from radiological and chemical releases and exposures to levels slightly below the No Action levels for normal operations. All workers involved in the transfer of the Pu would be monitored to ensure that their doses remain within acceptable levels. However, the radiological dose to onsite workers and the public would be within radiological limits. The health risk to the public and onsite workers would be within hazardous chemical regulatory levels. However, there would be a potential for accidents during the phaseout process from Pu handling, packaging, and transportation that could affect workers and the public. These potential accidents and their consequences have been included in the intersite transportation analysis. As mentioned in the No Action Alternative, only under unusual wind conditions at SRS would low income and minority populations have the potential to be disproportionately affected by an accidental release. Potential intersite transportation impacts related to all DOE sites could occur because of the increased risk of traffic accident fatalities.

For air quality, there could be some short-term impacts resulting from handling and shipping operations, but overall, the elimination of storage alternatives is not expected to result in any long-term impacts.

[Text deleted.]

4.6.3 DISPOSITION ALTERNATIVES

[Text deleted.]

Table 4.6.3–1 represents the incremental impacts to key environmental resources for the activities common to disposition alternatives. Table 4.6.3–2 represents the incremental impacts to the same resources for each individual disposition alternative.

Table 4.6.3–1. Incremental Net Increase During Operation for Activities Common to Disposition Alternatives

Resource	Pit Disassembly/ Conversion Facility	Pu Conversion Facility	MOX Fuel Fabrication
Land area used (ha)	12	28	81
Water usage (MLY)	94.6	80.5	56.8
Maximum direct employment	830	883	500
Risk of fatal cancer for MEI from lifetime operations	7.6×10^{-10} to 7.0×10^{-8}	4.8×10^{-10} to 4.6×10^{-8}	1.8×10^{-7} to 7.8×10^{-10}
Solid TRU waste (m^3/yr)	67	278	306
Solid LLW (m^3/yr)	102	1,743	153
Solid hazardous waste (m^3/yr)	0.7	11	153
Spent nuclear fuel[a] (t/yr)	0	0	0

[a] Residual heavy metal content.

4.6.3.1 Activities Common to Disposition Alternatives

Implementation of any of the disposition alternatives would require construction and operation of the pit disassembly/conversion facility or the Pu conversion facility, either at the same site or at two different sites. In addition, selection of any of the reactor alternatives would require construction of the MOX fuel fabrication facility, either collocated with the reactor or located at another site.

Pit Disassembly/Conversion Facility

Construction and operation of the pit disassembly facility would have no or negligible impacts to noise and geology at all of the DOE sites analyzed. The associated employment would generate minor socioeconomic benefits at all of the DOE sites.

Impacts to biological resources at each site are possible because of habitat loss associated with land disturbance. There is the potential for impacts to special status species at Hanford, to the desert tortoise at NTS, and playa wetlands at Pantex. At all of the DOE sites except ORR, cultural and paleontological resources could be affected wherever there is ground disturbance, especially in areas that have not been extensively surveyed. Operation may affect Native American resources at all sites except ORR. Waste management impacts could occur at Hanford, INEL, and SRS due to the increase in TRU waste shipments and onsite LLW disposal. A radioactive waste facility would be required at ORR, so potential impacts to waste management at ORR are possible. Impacts to waste management would occur at NTS and Pantex, where the pit disassembly/conversion facility would require construction of a radioactive waste management facility. Potential impacts from the pit disassembly/conversion facility to public and occupational health and safety exist from the radiological and hazardous chemical releases during normal operation. However, the annual radiological dose to onsite workers and the public would be within radiological limits. Similarly, the health risk to the public and onsite workers would be within hazardous chemical regulatory levels. As mentioned in the No Action Alternative discussion, only under unusual wind conditions at SRS would low income and minority populations have the potential to be disproportionately affected by accidental releases. Intersite transportation impacts related to all DOE sites could occur because of the increased risk of traffic accident fatalities.

Soil resources would be affected at all of the DOE sites under consideration due to ground disturbance associated with construction activities from the pit disassembly/conversion facility. Because this alternative would require an additional 946 million l/yr (25 million gal/yr) of water during operation, water resources would be affected at Pantex. Surface water and groundwater resources at the other DOE sites would be affected minimally by this alternative.

Table 4.6.3–2 Incremental Net Increase During Operation by Disposition Alternative[a]

Resource	Direct Disposition	Immobilized Disposition	Vitrification	Ceramic Immobilization	Electrometallurgical Treatment	5 Existing LWRs[b,c]	2 Partially Completed[b] LWRs	4 Evolutionary LWRs[b] (small)	2 Evolutionary LWRs[b] (Large)
Land area used (ha)	57	75.2	12	12	0	81	81	237	138
Water usage (MLY)	165.4	485.4	250	250	0	56.8	138,225	813-109,065	739-121,777
Maximum direct employment	342	1,180	768	860	83	700	1,775	2,500	2,160
Risk of fatal cancer for MEI from lifetime operations	1.4×10^{-14} to 4.7×10^{-13}	9.7×10^{-14} to 3.6×10^{-12}	3.6×10^{-11} to 1.3×10^{-9}	6.0×10^{-13} to 2.1×10^{-11}	3.8×10^{-9}	1.3×10^{-7} to 2.3×10^{-7}[c]	1.3×10^{-5}	2.1×10^{-7} to 2.4×10^{-5}	2.9×10^{-7} to 4.1×10^{-5}
Solid TRU waste (m^3/yr)	0.2	151	99	99	6	306	306	306	306
Solid LLW (m^3/yr)	5	29	14	14	55	153	267-1,427	1,233	1,153
Solid hazardous waste (m^3/yr)	17	38	19	19	0.8	153	207	261	207
Spent nuclear fuel (t/yr)[d]	0	0	0	0	0	70	70	70.6	76.5

[a] Does not include activities common to all disposition alternatives (that is, the Pu conversion facility and the pit disassembly/conversion facility).

[b] Includes the MOX fuel fabrication facility and two to four reactors as indicated.

[c] For the existing LWR, the analysis assumes that two LEU reactor cores would be replaced with MOX cores. Between 3 and 5 reactors would be needed if the LEU core was only partially replaced with MOX fuel.

[d] Residual heavy metal content.

Plutonium Conversion Facility

The environmental impacts of constructing and operating the Pu conversion facility would be identical to those previously identified for the pit disassembly/conversion facility with the following exceptions. The employment associated with construction and operation would generate small socioeconomic benefits at all affected sites. At ORR, NTS, and Pantex, the Pu conversion facility would require construction of a radioactive waste management facility. At Pantex, water requirements for this alternative are slightly less than for the pit disassembly/conversion facility. Also, the annual radiological doses to the public would be slightly lower for the conversion facility than for the disassembly/conversion facility. The doses to onsite workers would be higher for the conversion facility, however, all doses to the public and to onsite workers would be within regulatory limits.

4.6.3.2 Deep Borehole Category

There are two deep borehole category alternatives: the Direct Disposition Alternative and the Immobilized Disposition Alternative. Both require drilling deep boreholes, 4 km (2.5 mi) or more in depth, into geologically stable rock below the water table. The borehole facility would be similar for both alternatives. No specific locations have been identified for the deep borehole facilities, therefore, environmental impacts are evaluated for a generic site. However, the public and occupational health and safety impacts include estimates using representative DOE sites for analysis purposes. The types and range of likely impacts have been identified, but site-specific impacts cannot be determined at this time. Requirements for both alternatives would be in addition to those presented for pit disassembly/conversion facility. The annual radiological doses to the public would be slightly lower for the conversion facility than for the disassembly/conversion facility. The doses to onsite workers would be higher for the conversion facility, however, all doses to the public and to onsite would be within regulatory limits.

4.6.3.2.1 *Direct Disposition*

Under the Direct Disposition Alternative, surplus Pu would be removed from storage, processed through the pit disassembly/conversion facility or the Pu conversion facility, packaged, and placed into a deep borehole. The environmental impacts of implementing this alternative would be the sum of impacts described previously for the pit disassembly/conversion facility and the Pu conversion facility, in addition to the impacts described below.

Infrastructure requirements could exceed current capacities. Air emissions, particularly PM_{10} and TSP concentrations, would be expected to increase during the peak construction period. The potential exists for noise impacts from heavy construction equipment and increased traffic. Water resource requirements would increase during construction and operation, possibly affecting existing supplies, and surface water quality could be affected by discharge of wastewater. Geologic resources could be affected by restricted access, and soil disturbance would occur during construction. There would be a potential for biological resource impacts because of the loss of habitat and potential impacts to wetlands, aquatic resources, and special status species. Cultural resources could be affected whenever there is ground disturbance, especially in areas that have not been extensively surveyed. Operations may affect Native American resources. The associated employment would have a socioeconomic impact, and the level of service on local roadways could decline during construction.

Potential impacts from the Direct Disposition Alternative to public and occupational health and safety exist from the radiological and hazardous chemical releases during normal operations. However, the annual radiological dose to onsite workers and the public would be within radiological limits. The health risk to the public and onsite workers would be within hazardous chemical regulatory levels. Environmental justice impacts are possible if health and safety or environmental impacts disproportionately affect minority and low-income populations. Potential intersite transportation impacts related to the movement of materials to the deep borehole complex could occur primarily from nonradiological impacts (air pollution and highway accidents) as opposed to impacts from radiological releases.

Impacts to waste management would occur. Construction and operation of a deep borehole disposal facility for direct disposition would require the construction of waste management facilities. These would include facilities to treat and store generated TRU, low-level, hazardous, and nonhazardous wastes.

4.6.3.2.2 *Immobilized Disposition*

Under this alternative, surplus Pu would be removed from storage, processed through the pit disassembly/conversion facility or the Pu conversion facility and the ceramic immobilization facility, packaged, and placed in a deep borehole. The environmental impacts of implementing this alternative are the sum of the impacts previously described for the pit disassembly/conversion facility and the Pu conversion facility, in addition to the impacts described below.

Ceramic Immobilization Facility. Construction of the ceramic immobilization facility would have potential impacts to land resources, site infrastructure, air quality and noise, and geology and soils. The usage of one or more local roadways would increase during construction at INEL, Pantex, and ORR, and could lead to a temporary decrease in the level of service.

Construction and operation of the ceramic immobilization facility would affect land resources at ORR and water resources at Pantex. For land use at ORR, construction and operation of the ceramic immobilization facility would lead to a reduction in visual quality at the Bear Creek Round and Route 95 sensitive viewpoints, resulting in a VRM classification change from Class 4 to Class 5. Because this alternative would require an additional drawdown of 320 million l/yr (84.5 million gal/yr) of water during operation, water resources would be affected at Pantex. Surface and groundwater resources at the other DOE sites would not be affected by this alternative. At NTS, Pantex, and ORR, construction of a radioactive waste management facility would be necessary.

The potential for impacts to biological resources at each site except SRS exists due to habitat loss associated with land disturbance during construction. At Hanford, Pantex, and ORR, there would also be potential impacts to special status species. At NTS, the desert tortoise and other threatened and endangered species could be affected by construction activities. Playa wetlands at Pantex may be affected. At ORR, the potential for wetlands displacement exists due to land disturbance during construction. Aquatic resources at Pantex and SRS could be affected. At any site where there is ground disturbance (all sites under consideration), cultural and paleontological resources could be affected. Operation may have some impact on Native American resources. There would be the potential for impacts to waste management because of an increase in TRU waste shipments for all sites, onsite LLW disposal at Hanford, INEL, ORR, NTS, and SRS, and an increase in the number of LLW shipments from Pantex to NTS. At all of the DOE sites under consideration, soil resources would be affected by ground disturbance associated with construction activities.

Public and occupational health and safety impacts could result from the radiological and hazardous chemical releases during normal operations. However, the annual radiological dose to onsite workers and the public would be within radiological limits. The health risk to the public and onsite workers would be within hazardous chemical regulatory levels. As mentioned in the No Action Alternative discussion, exposures to minority and low-income populations in an accident would be dependent upon the magnitude of release and wind direction at the time of the accident. Intersite transportation impacts related to all DOE sites could occur primarily from nonradiological impacts (air pollution and highway accidents) as opposed to impacts from radiological releases.

Deep Borehole Complex. The deep borehole facilities required for this alternative would be similar to those for the Direct Disposition Alternative, with minor exceptions in the receiving and storage facilities and an additional pellet-grout mixing facility and process waste management at the emplacing facilities. Thus, the environmental impacts would be similar to those described previously for the Direct Disposition Alternative.

4.6.3.3 Immobilization Category

Under this category, surplus Pu would be immobilized to create a chemically stable form for emplacement in a HLW repository. The radiation level of the immobilized form would meet the Spent Fuel Standard, which would serve as a proliferation deterrent. There are three Immobilization Alternatives: Vitrification, Ceramic Immobilization, and Electrometallurgical Treatment. Requirements for all three would be in addition to those described previously for pit disassembly/conversion and Pu conversion.

4.6.3.3.1 *Vitrification*

Under the Vitrification Alternative, surplus Pu would be removed from storage, processed through the pit disassembly/conversion facility or the Pu conversion facility, packaged, and transported to the vitrification facility. The environmental impacts of implementing this alternative would be the sum of the impacts described previously for the pit disassembly/conversion facility and the Pu conversion facility, in addition to the impacts described below.

Construction and operation of the vitrification facility would impact land resources at ORR and water resources at Pantex. For land resources at ORR, construction and operation of the vitrification facility would lead to a reduction in visual quality at the Bear Creek Road and Route 95 sensitive viewpoints, resulting in a VRM classification change from Class 4 to Class 5. Because this alternative would require an additional drawdown of 250 million l/yr (66 million gal/yr) of water during operation, water resources would be affected at Pantex. Surface water and groundwater resources at other DOE sites would be affected minimally by this alternative.

Air quality impacts could occur at Pantex and SRS because pollutant concentrations would increase. The potential for impacts to biological resources exists at each site, except SRS, due to habitat loss associated with land disturbance during construction. There is also potential for impacts to special status species at Hanford, Pantex, and ORR; the desert tortoise at NTS; playa wetlands at Pantex; and wetlands and aquatic resources at ORR. At any site where there is ground disturbance (all sites under consideration), cultural and paleontological resources may be affected. Operation has the potential to affect Native American resources at all sites. Soil resources would be affected at all of the DOE sites under consideration by ground disturbance associated with construction activities.

Public and occupational health and safety impacts could result from the radiological and hazardous chemical releases during normal operations. However, the annual radiological dose to onsite workers and the public would be within radiological limits. The health risk to the public and onsite workers would be within hazardous chemical regulatory levels. As mentioned in the No Action Alternative discussion, exposures to minority and low-income populations in an accident is dependent upon the magnitude of release and wind direction at the time of the accident. Potential intersite transportation impacts related to all DOE sites could occur primarily from nonradiological impacts (air pollution and highway accidents) as opposed to impacts from radiological releases.

Waste management impacts could occur at Hanford, INEL, and SRS, because these sites may require expansion of their existing TRU waste management facilities and construction of sanitary, utility, and process wastewater treatment systems. Impacts to waste management would occur at NTS, Pantex, and ORR, because each site would require the construction of a radioactive waste facility. These three sites may also require the construction of sanitary, utility, and process wastewater treatment systems.

4.6.3.3.2 *Ceramic Immobilization*

Under the Ceramic Immobilization Alternative, surplus Pu would be removed from storage, processed through the pit disassembly/conversion facility or the Pu conversion facility, packaged, and transported to the ceramic immobilization facility. The environmental impacts of implementing this alternative would be the sum of the

impacts described previously for the pit disassembly/conversion facility and the Pu conversion facility, in addition to the impacts described below.

The environmental impacts of constructing and operating the ceramic immobilization facility would be identical to those identified in the preceding section for the vitrification facility, with the exception of public health and safety at all sites and air quality at Hanford, NTS, and INEL. The annual radiological doses to the public would be smaller whereas the dose to workers would be somewhat higher for the ceramic immobilization facility. Locating the ceramic immobilization facility at these sites could lead to high pollutant concentrations which would affect air quality.

4.6.3.3.3 *Electrometallurgical Treatment*

Under the Electrometallurgical Treatment Alternative, existing facilities at ANL-W at INEL are used as a basis for analysis. Such facilities would be modified to accommodate this added mission. Surplus Pu would be removed from storage, processed through the pit disassembly/conversion facility or the Pu conversion facility, packaged, and transported to the electrometallurgical treatment facility. The environmental impacts of implementing this alternative would be the sum of the impacts identified previously for the pit disassembly/conversion facility and the Pu conversion facility, in addition to the impacts described below.

Public and occupational health and safety, waste management, and intersite transportation would be the resources affected. Public and occupational health and safety impacts could result from the radiological and hazardous chemical releases under the Electrometallurgical Treatment Alternative. However, the annual radiological dose to onsite workers and the public would be within radiological limits. The health risk to the public and onsite workers would be within hazardous chemical regulatory levels. Waste management impacts would result if additional sanitary, utility, and process wastewater treatment systems are required. Potential intersite transportation impacts could occur at all DOE sites primarily from nonradiological impacts (air pollution and highway accidents) as opposed to impacts from radiological releases.

4.6.3.4 Reactor Category

Four disposition alternatives using reactor technologies would convert Pu to spent nuclear fuel by burning it in a reactor in the form of MOX fuel leading to disposition at a U.S. repository or within the Canadian spent fuel program. The four alternatives are existing LWR, partially completed LWR, evolutionary LWR, and CANDU reactor. Under the Reactor Category Alternatives, surplus Pu would be used as MOX fuel in domestic or Canadian reactors. The United States currently does not have a MOX fuel fabrication facility and does not engage in the commercial MOX fuel market, so a facility would have to be developed at a U.S. site. Under the Existing LWR Alternative, limited quantities of MOX fuel could be produced on an interim basis in existing European facilities using U.S. surplus Pu until a domestic facility is constructed.

4.6.3.4.1 *Mixed Oxide Fuel Fabrication Facility*

Each of the reactor alternatives would require the construction of a MOX fuel fabrication facility that may be collocated with the reactor or located at a separate site. The impacts are described below for DOE sites and a generic site.

Construction and operation of the MOX fuel fabrication facility would have no or negligible impacts to noise and geology at any of the DOE sites. There would be no or negligible impacts to these same environmental resources/issue areas at a generic site.

Because of the continued depletion of the Ogallala Aquifer, water resources would be affected at Pantex, where this alternative would require an additional drawdown of 56.8 million l/yr (15 million gal/yr). Surface and groundwater resources at the other DOE sites would be minimally affected by this alternative.

At all DOE sites, except Pantex, terrestrial resource impacts could result from habitat disturbance. Potential impacts to special status species during construction activities may occur at each DOE site. Playa wetlands at Pantex may be affected. At any site where there is ground disturbance (all DOE sites under consideration except ORR), especially in areas that have not be extensively surveyed, cultural and paleontological resources could be affected. Soil resources would be affected at all of the DOE sites under consideration due to ground disturbance associated with construction.

Potential impacts from the MOX fuel fabrication facility to public and occupational health and safety exist from the radiological and hazardous chemical releases during normal operations. However, the annual radiological dose to onsite workers and the public would be within radiological limits. The health risk to the public and onsite workers would be within hazardous chemical regulatory levels. As mentioned in the No Action Alternative discussion, exposures to minority and low-income populations in an accident would be dependent upon the magnitude of release and wind direction at the time of the accident. Potential intersite transportation impacts related to all DOE sites could occur, primarily from nonradiological impacts (air pollution and highway accidents) as opposed to impacts from radiological releases.

Impacts to these same environmental resources/issue areas could occur at a generic site: land resources, water resources, soil resources, biological resources, cultural resources, public and occupational health and safety, intersite transportation, and environmental justice.

Construction and operation of the MOX fuel fabrication facility would affect waste management at all of the DOE sites and the generic site. A TRU waste management facility would be required as part of the MOX fuel fabrication facility at NTS, Pantex, ORR, and the generic site. TRU waste management facilities at Hanford, INEL, and SRS would require expansion. All sites would require additional storage facilities where TRU waste would be staged until it is shipped.

4.6.3.4.2 *Existing Light Water Reactor*

Under the Existing LWR Alternative, surplus Pu would be removed from storage, processed through the pit disassembly/conversion facility or the Pu conversion facility, and processed by the MOX fuel fabrication facility. The finished MOX fuel would be transported to three to five LWRs for use instead of conventional uranium reactor fuel. The environmental impacts of implementing this alternative would be the sum of the impacts previously described for the pit disassembly/conversion facility and the Pu conversion facility, the impacts of the MOX fuel fabrication facility, and the reactor impacts described below. The impacts described are for a single reactor. The Pu disposition action would require a minimum of three to five existing LWRs.

The use of an existing LWR would require the substitution of MOX fuel for LEU fuel. There would be no or negligible impacts for all environmental resources/issue areas except public and occupational radiological health and safety, waste management, and intersite transportation. Public and occupational health and safety impacts could result from the radiological releases during normal operations that would be due to the change in doses received when a uranium core is replaced with a MOX core. However, the annual radiological dose to onsite workers and the public would be within radiological limits. The potential for impacts exist for waste management, because an expansion of spent nuclear fuel storage at the site may be required. Intersite transportation impacts related to the transportation of MOX fuel could occur, primarily from nonradiological impacts (air pollution and highway accidents) as opposed to radiological releases.

4.6.3.4.3 *Partially Completed Light Water Reactor*

Under the Partially Completed LWR Alternative, commercial LWRs on which construction has been halted would be completed to burn MOX fuel. The facility and operating characteristics of these units would be essentially the same as for the existing commercial LWRs discussed above. Because no specific site has been identified, impacts are analyzed for a representative site.

Under this alternative, surplus Pu would be removed from storage, processed through the pit disassembly/conversion facility or the Pu conversion facility, followed by the MOX fuel fabrication facility, and the finished MOX fuel transported to the completed LWRs for use instead of conventional LEU reactor fuel. The environmental impacts of implementing this alternative would be the sum of the impacts described previously for the pit disassembly/conversion facility and the Pu conversion facility, the impacts of the MOX fuel fabrication facility, and the impacts described below. The impacts described are for a single reactor. Since the Pu disposition action would require two partially completed LWRs, the requirements would be two times those identified if they are all at one site, or repeated at a second site if two separate geographical locations are chosen.

There would be potential impacts to biological resources, cultural and paleontological resources, soil resources, public and occupational health and safety, waste management, and intersite transportation. Local roads may experience an increase in usage during construction, leading to potential impacts to local transportation.

If ground disturbance is necessary for the completion of construction, both biological and cultural and paleontological resources may be affected. Operation may affect some Native American resources. Impacts to wetlands, aquatic resources, and threatened and endangered species may occur due to facility operations. Soil resources would be affected if ground disturbance is necessary for the completion of construction. Public and occupational health and safety impacts could result from the radiological and hazardous chemical releases under the Partially Completed LWR Alternative. However, the annual radiological dose to onsite workers and the public would be within radiological limits. The health risk to the public and onsite workers would be within hazardous chemical regulatory levels. Intersite transportation impacts related to the transportation of MOX fuel could occur because of the increased risk of traffic accident fatalities. Impacts to waste management could occur because of the introduction of spent nuclear fuel, LLW, and mixed LLW.

4.6.3.4.4 *Evolutionary Light Water Reactor*

Under the Evolutionary LWR Alternative, the individual reactors would be improved versions of existing commercial nuclear power reactors using light water as a moderator and coolant. The fuel rods would consist of MOX fuel. There could be two design approaches: a large evolutionary LWR and a small evolutionary LWR.

Under this alternative, surplus Pu would be removed from storage, processed through the pit disassembly/conversion facility or the Pu conversion facility, and processed through the MOX fuel fabrication facility. The finished MOX fuel would be transported to the evolutionary LWRs for use instead of conventional LEU reactor fuel. Therefore, the environmental impacts of implementing this alternative would be the sum of the impacts described previously for the pit disassembly/conversion facility and the Pu conversion facility, the impacts of the MOX fuel fabrication facility, and the impacts described below.

The summary of impacts presented below is based on the conclusions reached for the construction and operation of either a large or small evolutionary LWR. However, the proposed Pu disposition action would require a minimum of two large evolutionary LWRs or four small evolutionary LWRs. Thus, the requirements of implementing this alternative would nominally be two to four times those described if the reactors were built at one site, or would be repeated at more than one site if the reactors were built at multiple locations. Since the Storage and Disposition PEIS is not intended to support a siting decision for the disposition alternatives, the precise configuration is unknown at this time.

Construction and operation of the evolutionary LWR could have site impacts on infrastructure, noise, and geology. With respect to air quality, any increase in pollutant concentrations would not exceed applicable standards. Local roads may experience a decline in the level of service during construction at INEL, Pantex, and ORR.

The potential exists for impacts to biological resources, soil resources, cultural and paleontological resources, and public and occupational health and safety at all DOE sites; waste management at Hanford and INEL; and

intersite transportation. Habitat loss during construction could impact wildlife, including special status species, at all sites. At NTS, the desert tortoise could be affected during construction. At Hanford, ORR, and SRS, the potential exists for impacts to sensitive plants from the salt drift from wet cooling towers and to aquatic resources from blowdown waters from the cooling systems into local streams and rivers. Wetlands at Pantex, ORR, and SRS may also be affected. At sites where there is ground disturbance (all sites under consideration), cultural and paleontological resources could be affected. Native American resources may be affected by facility operation. At all of the DOE sites under consideration, soil resources would be affected by ground disturbance associated with construction activities. Hanford and INEL require either major upgrades to existing sanitary, utility, and process wastewater treatment systems or construction of new facilities.

Public and occupational health and safety impacts could result from the radiological and hazardous chemical releases during normal operations at all DOE sites. However, the annual radiological dose to onsite workers and the public would be within radiological limits. The health risk to the public and onsite workers would be within hazardous chemical regulatory levels. Intersite transportation impacts related to all DOE sites could occur, primarily from nonradiological impacts (air pollution and highway accidents) as opposed to radiological releases.

Construction and operation of the evolutionary LWR would have impacts on land resources at ORR; water resources at Pantex; public health and safety at SRS; and waste management at NTS, Pantex, ORR, and SRS. Land resources at ORR would be affected because the proposed use of vacant land would change the VRM classification from Class 3 to Class 5, resulting in visual impacts to the Watts Bar Lake and adjacent area's sensitive viewpoints; and the proposed facility location would not be within the ORR site boundary, but rather on the adjacent TVA land. Because of the continued depletion of the Ogallala Aquifer, water resources would be affected at Pantex, where this alternative would require an additional drawdown of 341 million l/yr (90 million gal/yr). However, this additional use, factored in with the projected decrease under No Action, would result in an overall decrease in water use of 30 percent by 2005. Surface and groundwater resources at the other DOE sites would be minimally affected by this alternative.

At SRS, the radiological dose to the population living within 80 km (50 mi) of the site under normal operations is estimated at 110 person-rem per year and represents 0.049 percent of natural background exposure. As mentioned in the No Action Alternative discussion, exposures to minority and low-income populations surrounding SRS in an accident is dependent upon the magnitude of release and wind direction at the time of the accident.

For waste management, all sites would require the construction of storage facilities for spent nuclear fuel, and both ORR and SRS would require the construction of sanitary, utility, and process wastewater treatment systems. In addition, Pantex would require LLW facilities or additional LLW shipments, and major upgrades or new construction of sanitary, utility, and process wastewater treatment systems.

4.6.3.4.5 *Canadian Deuterium Uranium Reactor*

Under the CANDU Reactor Alternative, surplus Pu would be removed from storage, processed through the pit disassembly/conversion facility or Pu conversion facility, and processed through the MOX fuel fabrication facility. The finished fuel would be transported to the Ontario Hydro Nuclear Bruce-A Generating Station in Ontario, Canada.

Other than intersite transportation impacts, the environmental impacts within the United States of implementing this alternative would be limited to the sum of the impacts described above for the pit disassembly/conversion, Pu conversion facility, and the MOX fuel fabrication facility. Potential intersite transportation impacts related to the transportation of MOX fuel could occur because of the increased risk of traffic accident fatalities. All other impacts would occur in Canada.

[Text deleted.]